# Study of the miscibility of Linear PE with Low density PE and Poly(ethylene-co-1-hexene) through single crystals melting point analysis

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In this work we analyze the miscibility of LPE with branched PEs of different molecular architecture (LDPE and LLDPE types). The method used is the analysis of the melting point depression of LPE single crystals embedded in a matrix of branched PE. The LLDPE samples are poly(ethylene-co-1-hexene) copolymers with narrow molar mass distributions and homogeneous comonomer distribution. The materials, with a range of comonomer content from 0 to 10 % molar, have been obtained by polymerization with single-site catalysts [1]. Details about LDPE samples can be found in reference [2].
From the results obtained by Martínez-Salazar et al. for LPE/LDPE systems, Zhao and Choi [3] discussed that the critical average branch content of LDPE for miscibility is only of about 2 branches per 100 backbone carbons. However, in the case of the LPE/LLDPE systems the critical average branch content of LLDPE is about 6 branches per 100 backbone carbons. This late experimental results are in agreement with those reported by Nicholson et. al by Neutron Scattering [4], emphasizing, at the same time, the important role that the molecular architecture plays on the miscibility of PE family.

References

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